

ROCKY FLATS ENVIRONMENTAL
TECHNOLOGY SITE

EMD OPERATING
PROCEDURES MANUAL
VOL I: FIELD OPERATIONS

Manual No.: 5-21000-OPS-FO
New Manual No.: 4-11000-ER-OPS-FO
Procedure No.: Table of Contents, Rev 72
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Effective Date: 09/15/94
Organization: Environmental Management

THIS IS ONE VOLUME OF A SIX VOLUME SET WHICH INCLUDES:

VOLUME I: FIELD OPERATIONS (FO)
VOLUME II: GROUNDWATER (GW)
VOLUME III: GEOTECHNICAL (GT)
VOLUME IV: SURFACE WATER (SW)
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PER R.B. HOFFMAN, CLASSIFICATION OFFICE
JUNE 11, 1991

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FO.13	Containerization, Preserving, Handling and Shipping of Soil and Water Samples	2	05/12/92
93-DMR-000530	Section FO.13 Modification	2	11/04/93
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FO.19	Base Laboratory Work	2	05/12/92
FO. 23	4-F99-OPS-FO.23 Management of Soil and Sediment Investigative Derived Materials (IDM)	0	01/11/94
94-DMR-000137	Training Requirements Clarification	0	01/28/94
94-DMR-000148	Section FO.23 Modifications	0	02/09/94
94-DMR-001108	Buried Instrumentation and Existing Soil	0	06/14/94
94-DMR-001350	Various Text Additions and Deletions Regarding Drums and Use of SOP FO.29	0	08/16/94

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FO.25	4-B11-ER-OPS-FO.25 Shipment of Radioactive Materials Samples	0	12/01/93
FO.27	4-BO1-ER-OPS-FO.27 Collection of Floor/Equipment Hot Water Rinsate Samples	0	07/26/93
FO.29	4-H46-ENV-OPS-FO.29 Disposition of Soil and Sediment Investigation-Derived Materials	0	06/24/94
94-DMR-001226	Allowance of Procedural Use for Waste Piles	0	07/15/94
FO.32	4-I50-ENV-OPS-FO.32 Treated Effluent Discharge Operable Unit 1, Building 891	0	04/13/94

DOCUMENT MODIFICATION REQUEST (DMR)

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Refer to 1-A01-PPG-001 for Processing Instructions.
Print or Type All Information (Except Signatures)

1. Date 8/29/94			25. DMR. No. 94-DMR- <u>001670</u>		
2. Existing Document Number/Revision 5-21000-OPS-FO.13, Rev. 2			3. New Document Number or Document Number if it is to be changed with this Revision		
4. Originator's Name/Phone/Page/Location Paul C. Gomez/8614/080			5. Document Title Containerization, Preserving, Handling and Shipping of Soil and Water Samples		
6. Document Type <input checked="" type="checkbox"/> Procedure <input type="checkbox"/> Other		7. Document Modification Type (Check only one) <input type="checkbox"/> New <input type="checkbox"/> Revision <input checked="" type="checkbox"/> Intent Change <input type="checkbox"/> Nonintent Change <input type="checkbox"/> Editorial Correction <input type="checkbox"/> Cancellation			
8. Item	9. Page	10. Step	11. Proposed Modifications		
1	5 of 18	5.1	Add "Plastic 5-gallon buckets" to the bulleted list.		
2	3 of 18	4.1	Add the following references: American Society of Testing and Materials (ASTM), Soil and Rock; Dimension Stone; Geosynthetics, Section 4, Volume 04.08, 1993 ASTM, Concrete and Aggregates, Section 4, Volume 04.02, 1993.		
3	7 of 18	6.1	Add Geotechnical to first sentence, describing the matrices.		
4	7 of 18	6.1	To last paragraph, add attached Table A-5 which show geotechnical parameters, containers, preservatives, and holding times for soil, geosynthetic, and asphalt base materials. <u>mm</u> ^{geotechnical}		
5	5 of 18	Table A-1	Add to Table After TCLP: Nitrate as N, 250 mL/P, G, Cool 4°C, 48 hours; and Nitrite as N, 250 mL/P, G, Cool 4°C, 48 hours		
6	6 of 18	Table A-5	Add the attached table as A-5.		
7	15 of 18	6.5	Add to the next to last bullet "...COCs and self-addressed-postage-paid envelope in..."		
12. Justification (Reason for Modification, EJO#, TP#, etc.)					
New SOW, new direction, remediation, field treatability, Phase II of field investigations by OU5 and OU7, OU2 Heat (6 port) treatability study. Mandatory changes to current version.					
If modification is for a new procedure or a revision, list concurring disciplines in Block 13, and enter N/A in Blocks 14 and 15. If modification is for any type of change or a cancellation, organizations are listed in Block 13, then Concuror prints, and signs in Block 14, and dates in Block 15.					
13. Organization		14. Print and Sign (if applicable)			15. Date (if applicable)
QS		Steve Luker <u>Steve Luker</u>			8-31-94
ED		Laura Tyler <u>Laura Tyler</u>			8/31/94
EOM		Susan Myrick <u>Susan L. Myrick</u>			8/31/94
OU2		Wanda Busby <u>Wanda Busby</u>			9/1/94
OU5, 6,7		Ed Mast <u>Ed Mast</u>			8/31/94
16. Originator's Supervisor (print/sign/date)		Beth Montano <u>Beth Montano</u> / 9-1-94			
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Patty Keifer/8698/080 <u>Patty Keifer</u>		3003		9/15/94	9/15/94
22. Accelerated Review? Yes <input type="checkbox"/> No <input type="checkbox"/>		23. ORC Review ORC Review Not Required: <u>This nonintent change is being processed as an Intent Change to expedite the DMR process.</u>			
24. Responsible Manager (print, sign, date)		John R. Dick <u>John R. Dick</u> 9/1/94			

REVIEWED FOR CLASSIFICATION/
BY NA
DATE NADOCUMENT CLASSIFICATION REVIEW WAIVER
FOR R.B. HOFFMAN, CLASSIFICATION OFFICE
JUNE 11, 1991

CONTAINERIZATION, PRESERVING, HANDLING AND SHIPPING OF SOIL AND WATER SAMPLES

EG&G ROCKY FLATS PLANT
EMD MANUAL OPERATION SOP

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Environmental Management

TITLE:
CONTAINERIZATION, PRESERVING,
HANDLING AND SHIPPING OF
SOIL AND WATER SAMPLES

Approved By:

/s/ J.E. Evered
(Name of Approver)

5/12/92
(Date)

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1	9/ 15 /94	94-DMR-001670
1	3/1/92	NA
1A	11/09/93	93-DMR-000667
2	9/ 15 /94	94-DMR-001670
2	11/09/93	93-DMR-000667
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2A	9/15/94	94-DMR-001670 :
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9	3/1/92	NA
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11	3/1/92	NA
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12	2/11/94	94-DMR-000143
15	9/ 15 /94	94-DMR-001670
Figure FO-13-2 (Added one page to existing 3)	7/22/94	DCN 92.01
Table A-1	9/ 15 /94	94-DMR-001670
Table A-1 (pages 1-2)	3/1/92	NA
Table A-1 (pages 3)	11/09/93	93-DMR-000667
Table A-1 (pages 4)	3/1/92	NA
Table A-2 to A-4	3/1/92	NA
Table A-5	9/ 15 /94	94-DMR-001670

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2.0 PURPOSE AND SCOPE

This standard operating procedure (SOP) describes procedures that will be used at Rocky Flats to define the SOPs addressing sample containers, preservatives, handling, packaging and shipping of soil/sediment and water samples collected at the Rocky Flats Plant (RFP).

3.0 RESPONSIBILITIES AND QUALIFICATIONS

All personnel performing these procedures are required to have the appropriate health and safety training as specified in the site-specific Health and Safety Plan. In addition, all personnel are required to have a complete understanding of the procedures described within this SOP and receive specific training regarding these procedures.

Only qualified personnel will be allowed to perform these procedures. Required qualifications are based on minimum of a two year science related degree and/or education, previous experience, onthe-job training, and supervision by an onsite chemist. The subcontractor's project manager will document personnel qualifications related to this procedure in the subcontractor's project QA files.

4.0 REFERENCES

4.1 SOURCE REFERENCES

A Compendium of Superfund Field Operations Methods. EPA/540/P-87/001. December 1987.

American Society for Testing and Materials (ASTM), Soil and Rock; Dimesion Stone; Geosynthetics, Section 4, Volume 04.08, 1993.

ASTM, Concrete and Aggregates, Section 4, Volume 04.02, 1993.

DOE 1987: The Environmental Survey Manual. DOE/EH-0053, Volumes 1-4. August 1987.

Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA. Interim Final. October 1988.

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5.0 EQUIPMENT

5.1 EQUIPMENT LIST

The following list of equipment is not intended to be task specific. The equipment and materials shown are the minimum that may be needed to ensure that proper procedures are followed for sample handling, packaging, and shipping.

- Sample containers/bottles
- Coolers
- Thermometer
- Blue ice
- Sample labels
- COC forms
- Decontamination equipment¹
- Preservatives
- Baggies for containers
- Bubble wrap
- Vermiculite or equivalent
- Strapping and clear tape
- Custody seals
- Garbage bags
- Metal paint cans²
- Plastic 5-gallon buckets

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1 Decontamination equipment and procedures are thoroughly discussed in the SOP FO.3, General Equipment Decontamination

2 Large enough to accommodate sample containers

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The matrices discussed in this SOP for chemical, geotechnical, and radiological parameters are:

Soil Matrix - to include soils, sediments, and sludges (see SOP GT.8, Surface Soil Sampling, SOP SW.6, Sediment Sampling)

Water Matrix - to include surface water, groundwater and process liquids (see SOP GW.6, Groundwater Sampling; SOP SW.3, Surface Water Sampling, SOP SW.7, Collection of Tap Water Samples; SOP SW.8, Pond Sampling; and SOP SW.9, Industrial Effluent and Pond Discharge Sampling)

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Tables A-1 and A-2 show both CLP and non-CLP parameters of interest for water and soil matrices with the associated container size, preservatives (chemical and/or temperature); and holding times. Tables A-3 and A-4 show radiological parameters, containers, preservatives, and holding times for water and soil matrices. Table A-5 shows geotechnical parameters, containers, preservatives, and holding times for geotechnical soil and geosynthetic materials.

6.2 CONTAINER LABELING, DECONTAMINATION, AND FIELD PACKAGING

The sample bottles will be labeled by the sample manager or field sampling team. Collection time and date will be completed in the field by the sampler. The labels will indicate:

- Activity name and/or number
- Unique sample number
- Sample time and date
- Chemical preservative used
- Sample type (grab, composite)
- Analyses required

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- Wrap glass containers in bubble pack.
- Verify that all samples requiring screening have reported estimated radiological activity levels.
- Place bagged and wrapped sample containers (except VOC vials) upright in the cooler with approximately 1 inch between them.
- Place bagged and wrapped sample containers upright, except for the volatile organic compounds (VOC) vials in the cooler with approximately 1 inch between them and the sides of the cooler.
- Fill the cooler approximately three-quarters full of vermiculite, making sure that sample containers are securely packed.
- Insert the two VOC vials upright in the center of the cooler.
- Fill the cooler with vermiculite, allowing adequate space at the top for blue ice.
- Bag the blue ice (or equivalent) and place several packages in the top space of the cooler**.
- Seal the signed COCs and self-addressed-postage-paid envelope in a plastic bag and tape it to the underside of the lid of the cooler.
- Tape the drain of the cooler shut.

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** See Appendix A, Tables 1 and 2 for parameters requiring $4^{\circ}\text{C} \pm 2^{\circ}\text{C}$.

TABLE A-1 (continued)

SAMPLE CONTAINERS, SAMPLE PRESERVATION, AND SAMPLE HOLDING TIMES
FOR MISCELLANEOUS PARAMETERS

WATER MATRIX

Parameter	Sample Volume ^a /Container	Preservative	Holding Time
<u>Liquid - Low to Medium Concentration Samples (continued)</u>			
94-DMR-001670 Toxicity Characteristic Leaching Procedure (TCLP)	4 L amber glass	Cool, 4°C	Extract within 7 days, analyze within 40 days
Nitrate as N	250 mL/P, G	Cool, 4°C	48 hours
Nitrite as N	250 mL/P, G	Cool, 4°C	48 hours
Fluoride	1 L/P	None	28 days
Hardness	300 mL/P, G	1:1 Nitric Acid, pH<2	6 mo
Nutrients ^b	2 L/P, G	1:1 Sulfuric Acid, pH<2, Cool, 4°C	28 days
Oil and Grease	1-L widemouth amber glass with Teflon liner	1:1 Sulfuric Acid, pH<2, Cool, 4°C	28 days
Organic Halides - Total (TOX)	250 mL amber glass with Teflon lined septum closure	Sulfuric Acid, pH<2; Cool, 4°C	14 days
pH	In situ, beaker or bucket	None	Analyze Immediately
Phenols	1-L amber glass with Teflon lined closure	1:1 Sulfuric Acid, pH<2, Cool, 4°C	28 days
Phosphate-Ortho	1-L/P, G	Cool, 4°C	48 hr
Phosphorus, Total Dissolved	500 mL/P, G	1:1 Sulfuric Acid, pH<2, Cool, 4°C	28 days

^a P = Plastic (polyethylene); G = Glass

TABLE A-5
SAMPLE CONTAINERS, SAMPLE PRESERVATION, AND SAMPLE HOLDING
TIMES FOR GEOTECHNICAL SAMPLES
SOIL/GEOSYNTHETIC MATRIX

Parameter	Container	Preservative	Holding Time
Geotechnical Parameters:			
Atterberg Limits ¹ , Grain Size Distribution (Particle Size) ³ , Moisture ⁴ , Specific Gravity, Visual Classification	One-gallon Zip-Loc Baggie ² (500 grams per test if listed once)	None	28 days
Bulk Density (Proctor Test), Minimum (Maximum) Index Density	5-gallon Bucket ⁵	None	6 mos.
Compression:			
Unconfined Compres- sive; One-dimensional Consolidated; Unconsolidated Undrained Compressive, Direct Shear ⁷ , Expansion Index	1-Shelby tube (3" diameter x 30" length) completely filled ⁶	None	6 mos.
Permeability:			
Saturated Hydraulic Conductivity (Constant Head); Saturated Hydraulic Conductivity (Constant Flow, Rate); Capillary Moisture Relationships; Relative Hydraulic Conductivity for Air	1-Shelby tube (3" diameter x 30" length) completely filled ⁶	None	6 mos.

- 1 Atterberg Limits include Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- 2 The entire suite of analytical parameters can be performed on approximately 2-3 kilograms of material provided that the maximum grain diameter does not exceed 1-1/2 inches. Individually, the parameter test will require 500 grams of sample; therefore, use individual 500 gram samples if less than three of these parameters are requested for each sample.
- 3 Grain Size Distribution includes Sieve Analysis of Fine and Course Aggregates and Particle Size Analysis.
- 4 Moisture includes Laboratory Determination of Water (Moisture) Content of Soil and Rocks.
- 5 Thirty pounds of material is required.
- 6 Shelby tubes may be replaced with three California liners or three 2.5 inch U-type samples.
- 7 Direct Shear includes Soils Under Consolidated Drained Conditions. For Geosynthetic material collect a 12 inch x 12 inch sample.

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